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Shrub Spacing and Surface Shear Stress Distributions: A Wind Tunnel Study

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Abstract

This study attempts to quantify the role of desert shrub spacing on the spatial pattern of shear stress on the soil surface. In a wind tunnel, the naphthalene sublimation technique was used to map shear stress under varying situations of shrub spacing. The technique is based on the amount of sublimation of naphthalene during a wind tunnel run; the amount is a function of surface temperature and shear stress (Lee, Chyu and Greeley, submitted, *Earth Surface Processes and Landforms*). The results suggest that flow acceleration around shrubs enhances shear stress, with maximum reduction in shear stress at intermediate spacings. At high spacings, the shrubs have little effect on the ground surface away from them and at low spacings, a high fraction of the ground surface is affected by flow acceleration around individual shrubs. Field studies are needed to see if these laboratory findings are applicable to real world conditions.